

Activity 6.4b-The Floating Can

Purpose

Engineers often do not have the luxury of being able to design something, build it, and see if it works. What they build must work the first time. Some projects are simply too expensive or dangerous to allow the engineer to be anything other than correct. Engineers use math and science to solve problems.

Materials

Any straight sided can, round, rectangular, or square
 Accurate linear measuring device (caliper)
 A scale or balance, accurate to 0.1 gram
 Sand
 A container deeper than the tallest can you plan on using
 Water
 Research about buoyancy method using Archimedes' principle

Procedure

1. In this activity, the problem is to load an empty can with as much sand as possible, yet be absolutely sure it will float when placed in water.
2. The design goal for this activity is to float the can with only one centimeter of the can's side above the waterline. See diagram 1.

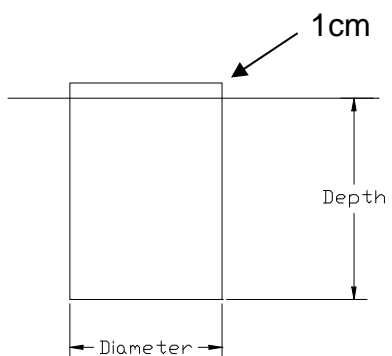


Diagram 1.

3. Weigh the empty can and record the weight here

4. Calculate the volume of the can that needs to be below water. Show your calculations here.

5. Calculate the weight of sand necessary to add to the can to have the can float at the desired depth. Show your work here.

6. Add the required weight in sand and test float your can. If it meets the requirements obtain your teachers signature

Signature _____

Conclusion

1. Was it necessary to completely fill the can with sand? Why or why not?

2. Explain why it would it be possible to construct a canoe from concrete to carry two average sized people and state what the parameters you need to consider would be.